Washington State Department of Transportation

Hood Canal Bridge East-half Replacement and West-half Retrofit Project

Anchor Cable Removal and Replacement Facts

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Why is WSDOT replacing the anchor cables?
The new SR 104 Hood Canal Bridge east-half anchors are larger and farther from the bridge than the existing ones. The bridge is also larger and the new cables must be strong enough to accommodate future increases in capacity should the bridge be widened from two to four lanes.

How big are the cables?
The larger, **3-inch diameter** cables are stronger than the existing cables and will keep the new structure in place. The new cables are comprised of pre-stretched zinc-coated structural steel with a minimum breaking strength of more than **1 million pounds** – meaning just **two cables** could lift the **Tacoma Dome roof** and an additional **600,000 pounds** and still not be at their capacity.

What do the cables do?
The anchor cables run from adjustable steel tracks inside the pontoons and loop through the **20 new east-half anchors** that are anywhere from **60 to 380 feet below** the surface of the Hood Canal. End to end, the cables reach a combined length of more than **12 miles** – that's almost enough cable to stretch from **Brinnon to Quilcene.**

How large are the anchors?
Twenty new anchors were built in 2006-2007 and will work with the anchor cable to hold the new bridge in place. The anchors, which are enormous, bowl-shaped concrete structures that are filled with rock for additional weight were set at precise points in Hood Canal in summer 2007. At **27 feet** tall and **46-60 feet** in diameter, the structures resemble enormous concrete bowls tipping the scales at combined weight of more than **45.2 million pounds** – more than **10 Statues of Liberty.**

Anchor Cable Replacement Process:
Below are the current plans for installing the three-inch diameter cables through the anchors and connecting them to the pontoons.

1. Divers install cable clamps to the existing 1.5-inch anchor cables that currently secure the east half in place.
2. After the bridge has been closed to traffic and as the existing bridge is being cut into three separate assemblies, derrick barges will remove the existing anchor cables and attach them to buoys in preparation for use on the new east half pontoons.
3. As new east-half pontoon assemblies are floated into position, the existing anchor cables are attached in sequence to secure the new bridge assemblies. This helps facilitate the fastest opening to traffic, and will assist with attachment of the permanent anchor cables to occur after assembly of the bridge has been completed.
4. Immediately after bridge has been secured in place, crews will begin installing the new 3-inch anchor cables. This begins with the transfer of the cables onto large spools approximately 12-feet in diameter.
5. Using a smaller "messenger cable" already installed through the submerged anchors, crews will begin to pull the larger cables from a barge and through U-shaped hawse pipes in the achors.
6. The new cables are pulled through large cylindrical steel blocks. These blocks are centered and secured on the cable and work as ball bearings between the cable and the anchor.
7. Bring the anchor cable ends through the "wet cell" of the pontoon – a cell that allows the cable to enter the pontoon while keeping water out of the main pontoon cells and anchor gallery cells
8. Socket the anchor cables into place inside the anchor gallery
9. Tighten anchor cables along the track assemblies to ensure correct alignment

What protects the cables against corrosion?
The submerged portion of the steel anchor cables are protected against corrosion damage by cathodic protection systems. Rectifiers in the galleries charge the anchor cables with a small, negative electrical current, turning the cables themselves into cathodes or electrical conductors. The current runs through the length of the cable and repels negatively charged ions that promote the oxidation process, keeping the cable free from rust.

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Cross-section view of anchor gallery